L Number	Hits	Search Text	DB	Time stamp
39	63	"4414621"	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:37
40	5	"5892509"	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:37
41	53	"4430526"	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:38
42	119	"4414621" or "5892509" or "4430526"	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:38
43	718	345/619	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:38
44	0	345/619 and ("4414621" or "5892509" or "4430526")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:38
45	51	345/$.ccls. and ("4414621" or "5892509" or "4430526")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:39
46	51491	345/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:39
47	3794	345/$.ccls. and embed$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:39
48	0	345/$.ccls. and embed$4 and digital adj negative	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:40
49	0	("4414621" or "5892509" or "4430526") and embed$4 and digital adj negative	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:40
50	0	"4414621" and embed$4 and digital adj negative	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:40
51	0	"5892509" and embed$4 and digital adj negative	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:40
52	0	"4430526" and embed$4 and digital adj negative	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:40

53	8	("4414621" or "5892509" or "4430526") and embed$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:41
54	3794	345/$.ccls. and embed$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:41
55	3799	345/$.ccls. and embed$4 or (("4414621" or "5892509" or "4430526") and embed$4)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:41
56	1370	(345/$.ccls. and embed$4 or (("4414621" or "5892509" or "4430526") and embed$4)) and resolution	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:43
57	1192	(345/$.ccls. and embed$4 or (("4414621" or "5892509" or "4430526") and embed$4)) and resolution and image$1	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:43
58	2	(345/$.ccls. and embed$4 or (("4414621" or "5892509" or "4430526") and embed$4)) and resolution and image$1 and (camera or picture) same digital same negative	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:45
59	9	embe$5 and ("4414621" or "5892509" or "4430526")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:45
60	3833	embe$5 and 345/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:45
61	3802	embed$5 and 345/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:46
62	8	embed$5 and ("4414621" or "5892509" or "4430526")	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:46
63	3807	(embed$5 and 345/$.ccls.) or (embed$5 and ("4414621" or "5892509" or "4430526"))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:46
64	2211	((embed$5 and 345/$.ccls.) or (embed$5 and ("4414621" or "5892509" or "4430526"))) and digital	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:46
65	616	((embed$5 and 345/$.ccls.) or (embed$5 and ("4414621" or "5892509" or "4430526"))) and digital and camera	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:46
66	381	((embed$5 and 345/$.ccls.) or (embed$5 and ("4414621" or "5892509" or "4430526"))) and digital and camera and link$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:46

67	374	((embed$5 and 345/$.ccls.) or (embed$5 and ("4414621" or "5892509" or "4430526"))) and digital and camera and link$3 and display	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:47
68	81	((embed$5 and 345/$.ccls.) or (embed$5 and ("4414621" or "5892509" or "4430526"))) and digital and camera and link$3 and display and resolution near5 (low or lower or lowest)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:48
69	19	((embed$5 and 345/$.ccls.) or (embed$5 and ("4414621" or "5892509" or "4430526"))) and digital and camera and link$3 and display and resolution near5 (low or lower or lowest)and thumbnail$1	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:49
70	0	((embed$5 and 345/$.ccls.) or (embed$5 and ("4414621" or "5892509" or "4430526"))) and digital and camera and link$3 and display and resolution near5 (low or lower or lowest)and thumbnail$1 and 345/619	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:50
71	1	digital and camera and link$3 and display and resolution near5 (low or lower or lowest)and thumbnail$1 and 345/619	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:51
72	0	digital and camera and link$3 and display and resolution near5 (low or lower or lowest)and thumbnail$1 and 345/619 and embed$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:50
73	99	digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:51
74	77	digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:52
75	98	digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:52
76	36	digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:53
77	4	digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 original	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:53
78	15	digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 low$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:53

79	3	(digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 original) and (digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 low$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:55
80	16	(digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 original) or (digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 low$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:55
81	16	((digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 original) or (digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 low$3)) and camera and digital	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:56
82	13	((digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 original) or (digital and camera and link$3 and display and resolution same (low or lower or lowest)and thumbnail$1 and embed$4 and (edit$3 or manipulat$5 or modif$9)near10 (embed$4 or thumbnail$1 or link$3)and resolution$1 near5 low$3)) and camera and digital and edit$3 and display$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/03/21 13:56

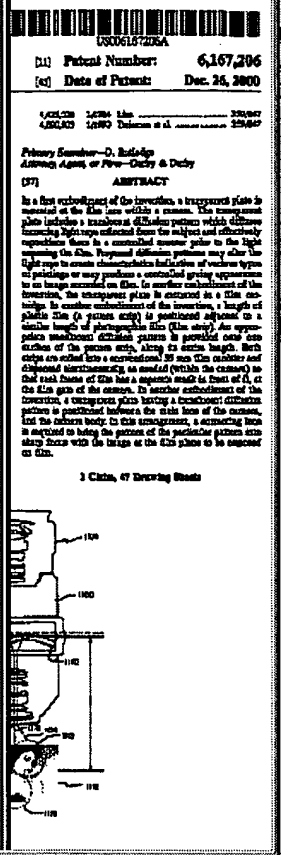
Start 9:28 PM
EAST - [mpeg4.wsp:1]
EAST Browser - L18: (2) foreground a... | US 6167206 A | Tag: S | Doc: 2/2 | Format : KWIC
File Edit View Tools Window Help

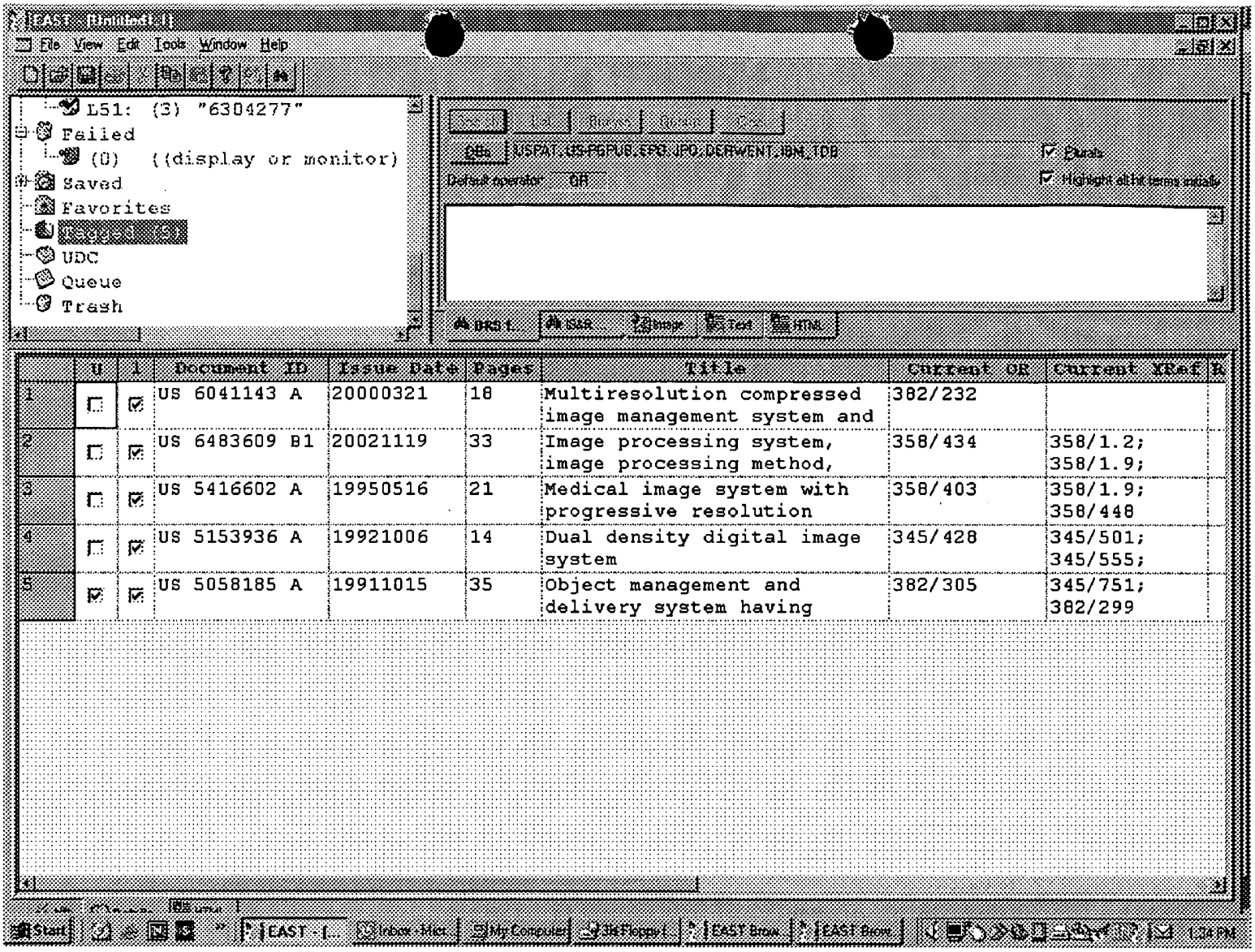
camera 600 may use controller 624 to darken-out the bright regions of the image in real-time as it is being viewed through eyepiece 610. Similarly, the lighter regions of the image may be selectively darkened using controller 624. When the compensated image appears correct (or otherwise desirable), the image (with the selected compensation) may be recorded on film 614, as described above (see FIG. 34).

Detailed Description Text - DETX (88):

Although the embodiments thus described relate to modifying image light entering a "still"-type camera prior to the image light exposing film, Applicant further contemplates employing the image light modification for other recording media. For example, after a negative (or transparency) is made, and a print is to be developed, the negative is positioned within an enlarger. A light source projects the image recorded on the negative onto photographic paper or a large CCD (for video recordings, or scanning). According to another aspect of the invention, a modifier may be positioned either directed adjacent to the negative, adjacent to the paper, or at an intermediate position, so that the projected image light is modified, in a manner described above, prior to the light exposing the paper (or downloaded to electronic memory. The modifier may be positioned within a slot located within the enlarger or simply overlaid with the negative within the negative carrier. Also, a modifier, as described above, may be used to distort the image light prior being "recorded" by an electronic scanner and downloaded into a computer. Although certain computer software programs are capable of electronically distorting a stored image, this process is very time consuming. Downloading a per-modified image into the computer saves time and introduces effects that are not easily attainable using a computer program.

Detailed Description Text - DETX (119):





	U	I	Document ID	Issue Date	Pages	Title	Current OR	Current XRef	R
1	☐	☑	US 6041143 A	20000321	18	Multiresolution compressed image management system and	382/232		
2	☐	☑	US 6483609 B1	20021119	33	Image processing system, image processing method,	358/434	358/1.2; 358/1.9;	
3	☐	☑	US 5416602 A	19950516	21	Medical image system with progressive resolution	358/403	358/1.9; 358/448	
4	☐	☑	US 5153936 A	19921006	14	Dual density digital image system	345/428	345/501; 345/555;	
5	☑	☑	US 5058185 A	19911015	35	Object management and delivery system having	382/305	345/751; 382/299	

Brief Summary Text - BSTX (41):

The system further includes an object or image scaling unit. having an input coupled to the higher resolution object decompression unit, for converting the first resolution digitized object or document image into a third resolution digitized object or document image having the third resolution.

Brief Summary Text - BSTX (45):

The resulting system reduces communications traffic on the network because of the smaller compressed data records which are transmitted for the low resolution operations. Access time for storing and reading the lower resolution compressed data records is also reduced; however, this lower traffic and faster access time are obtained without sacrificing the availability of high resolution compressed data records which are occasionally needed for printing and other high resolution operations.

Detailed Description Text - DETX (16):

Each of the image terminals 21 is connected to a communication network 38 (e.g., a token ring network including a network controller) which is connected to an object storage and delivery manager 48 (hereinafter OSDM).

EAST Browser - [1: 17/4 filed.adj.ent. | US 6449480 B1 | Doc: 17/74 | Format: KWIC

File Edit View Tools Window Help

Detailed Description Text - DETX (13):

The review screen layout is based on a filmstrip metaphor which allows users to quickly move forward and backward among pictures chronologically. In a preferred embodiment, several small-sized versions of the captured images, called thumbnails 700, are displayed in a row across the LCD screen 402. The user may scroll through the series of displayed thumbnails 700 in the LCD screen 402 using the four-way navigation control button 409. The direction of scrolling is capably mapped to the horizontal left/right buttons 410a and 410b. When the user presses the left/right buttons 410, the thumbnails 700 are scrolled-off the LCD screen 402 and replaced by new thumbnails 700 representing other captured images.

Detailed Description Text - DETX (14):

Details | Text | Image | HTML | KWIC

(54) METHOD AND SYSTEM FOR PROVIDING AND UTILIZING FILE ATTRIBUTES WITH DIGITAL IMAGES

(75) Inventor: John F. Fawley, Cupertino, CA (US)

(73) Assignee: FlashPoint Technology, Inc., Peterborough, NH (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/290,559

(22) Filed: Apr. 13, 1999

(51) Int. Cl.[7] G06K 15/00

(52) U.S. Cl. 358/1.15; 358/1.9

(58) Field of Search 358/1.15, 1.9, 1.13, 501, 401, 403

(56) References Cited

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2001/0028474 A1 * 10/2001 Parsield et al. 3

* cited by examiner

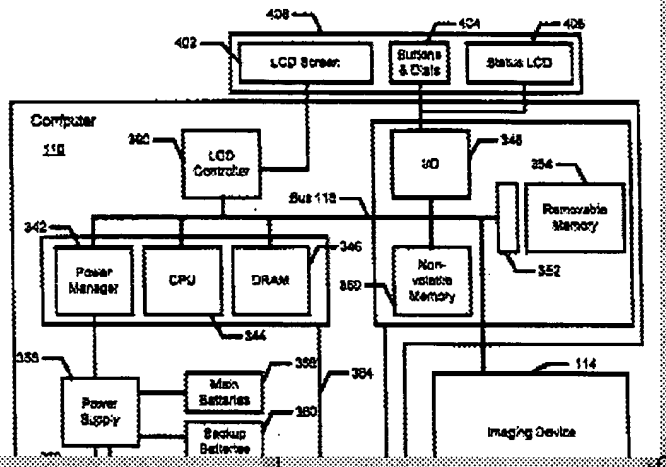
Primary Examiner—Jerome Grant, II

(74) Attorney, Agent, or Firm—Sawyer Law Group

(57) ABSTRACT

Method and system aspects for providing enhanced image file handling with a digital image capture device. The present invention includes the designation of at least one format attribute of a plurality of file format attributes for captured digital images in the digital image capture device. Further included is the establishment of one or more rules for digital image file handling based on the plurality of format attributes, and the manipulation of digital image data according to a selected rule set of the one or more rules. The automatic file handling extends to a photosystem component that includes at least one computer system or to the digital image capture device that also provides or utilizes the attributes for automatic image file handling.

18 Claims, 6 Drawing Sheets



Details | Text | Image | HTML | Full

Start | 09224760\7 Non-Fin... | EAST - [Untitled: 1] | EAST Browser - L1: [7 | EAST Browser - L... | 2:49 PM

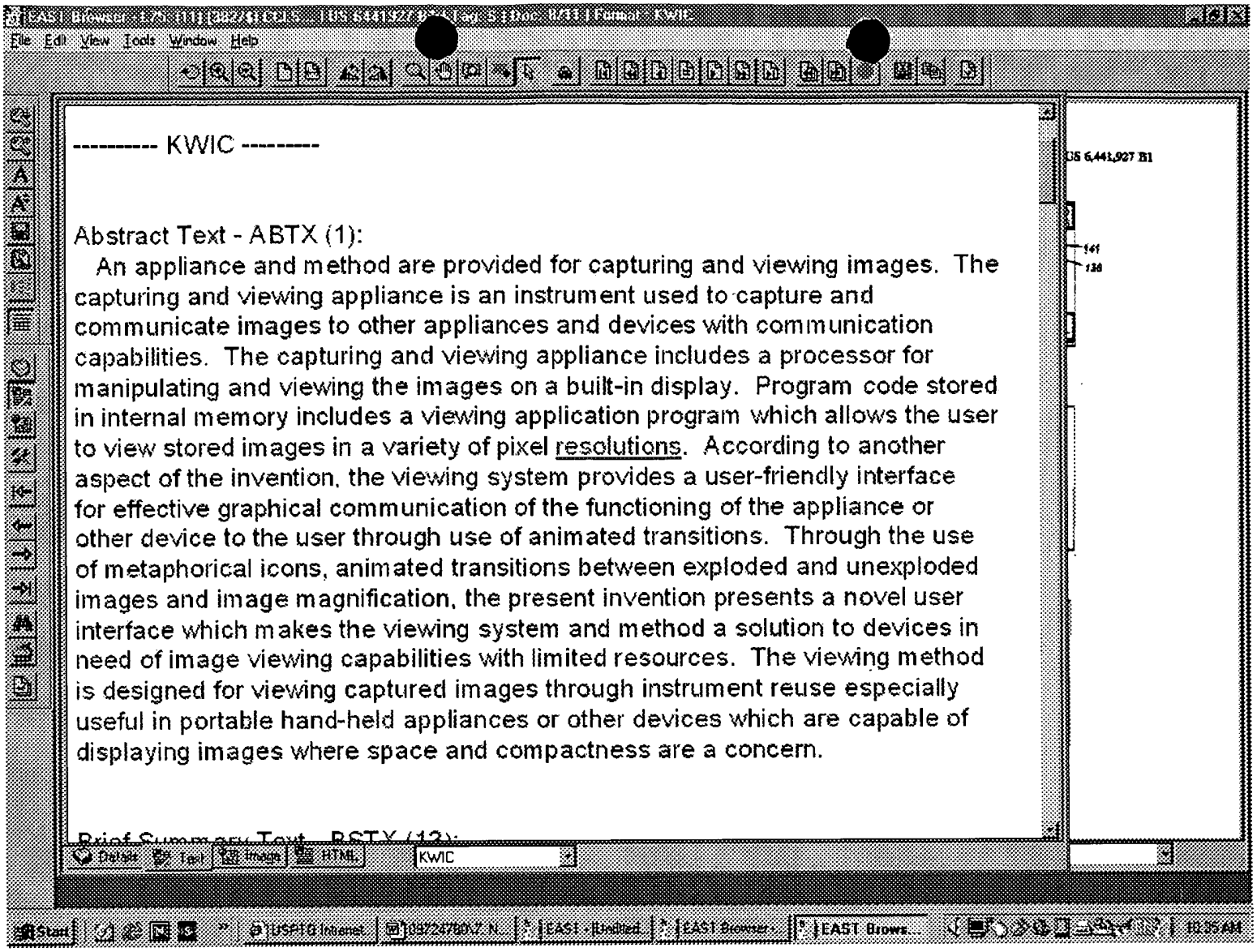
storage, will have a minimized communications traffic on the communications networks used by the object management and retrieval system, and yet will maintain the availability of high resolution images for occasional high resolution requirements when the object management and retrieval system is utilized for image storage/retrieval. Further, the prior art has failed to provide an object management and retrieval system which can perform desired object-related operations with only a modicum of interactions between the operations of a host computing system and said object management and retrieval system.

Brief Summary Text - BSTX (31):

A data processing system is disclosed for the storage/retrieval and display of objects and document images, and includes a workstation having a document input scanner coupled thereto for digitizing document images at a first resolution, an image display unit for displaying digitized document images at a second resolution which is less than the first resolution and a printer for printing digitized document images at a third resolution greater than the second resolution, the workstation being coupled to an object storage and delivery manager (OSDM) and storage.

Brief Summary Text - BSTX (41):

The system further includes an object or image scaling unit, having an input coupled to the higher resolution object decompression unit, for converting the



--------- KWIC ---------

Abstract Text - ABTX (1):

An appliance and method are provided for capturing and viewing images. The capturing and viewing appliance is an instrument used to capture and communicate images to other appliances and devices with communication capabilities. The capturing and viewing appliance includes a processor for manipulating and viewing the images on a built-in display. Program code stored in internal memory includes a viewing application program which allows the user to view stored images in a variety of pixel resolutions. According to another aspect of the invention, the viewing system provides a user-friendly interface for effective graphical communication of the functioning of the appliance or other device to the user through use of animated transitions. Through the use of metaphorical icons, animated transitions between exploded and unexploded images and image magnification, the present invention presents a novel user interface which makes the viewing system and method a solution to devices in need of image viewing capabilities with limited resources. The viewing method is designed for viewing captured images through instrument reuse especially useful in portable hand-held appliances or other devices which are capable of displaying images where space and compactness are a concern.

Brief Summary Text - BSTX (13):

Detailed Description Text - DETX (6):

Application software 70 can be broken into several modules corresponding to the various features of appliance 22, as shown in FIG. 2. These software modules include an initialization module 76, a capture page module 78, a thumbnail view module 82, a zoom view module 84, a page rotation module 86, an attach page module 88, a detach page module 92, a delete page module 94, a send page module 96, an error utility module 98, a help utility module 102 and a menu/navigation interface module 104. Note that an image captured in memory is interchangeably referred to herein as a "page" because the image is portrayed in appliance 22 as a physical page of text and/or imagery. A brief overview of each of the aforementioned modules follows hereafter.

Detailed Description Text - DETX (7):

Initialization module 76 contains the boot software that is invoked when appliance 22 powers up. This module works closely with operating system 68 and device drivers 72 to perform any hardware initialization for processor 62, memory devices 64, display 24, and software initialization for global resources, such as message queues and buffers, system tasks, and memory partitions. Capture page module 78 controls the acquisition of images through photoelement array 52 and their conversion into a suitable format for storage in memory 64. Thumbnail view module 82 provides the default visual for pages and icons shown on display 24. The thumbnail view presents an entire page on

Detailed Description Text - DETX (7):

Initialization module 76 contains the boot software that is invoked when appliance 22 powers up. This module works closely with operating system 68 and device drivers 72 to perform any hardware initialization for processor 62, memory devices 64, display 24, and software initialization for global resources, such as message queues and buffers, system tasks, and memory partitions. Capture page module 78 controls the acquisition of images through photoelement array 52 and their conversion into a suitable format for storage in memory 64. Thumbnail view module 82 provides the default visual for pages and icons shown on display 24. The thumbnail view presents an entire page on display 24 as illustrated in FIG. 8C. Zoom view module 84 allows the user to magnify a portion of a page as illustrated in FIG. 8D. The operation of the zoom view module 84 will be discussed in detail hereinafter. Page rotation module 86 allows the user to rotate a page either in thumbnail or zoom view in 90.degree. increments. Attach page module 88 allows the user to logically join pages together to form a group of pages that can be deleted, sent or viewed as an individual unit, but not rotated or zoomed. Rotation and zoom always apply only to the current page. Conversely, detach page module 92 allows the user to separate a page or pages from a previously formed group. Send page module 96 allows the user to transfer a page or group of pages to another appliance, device or system through the serial or IR communication ports of appliance 22. Error utility module 98 provides notification to the user when the user attempts an invalid operation. Help utility module 102 provides the user, in real time, with general instructions and animations on

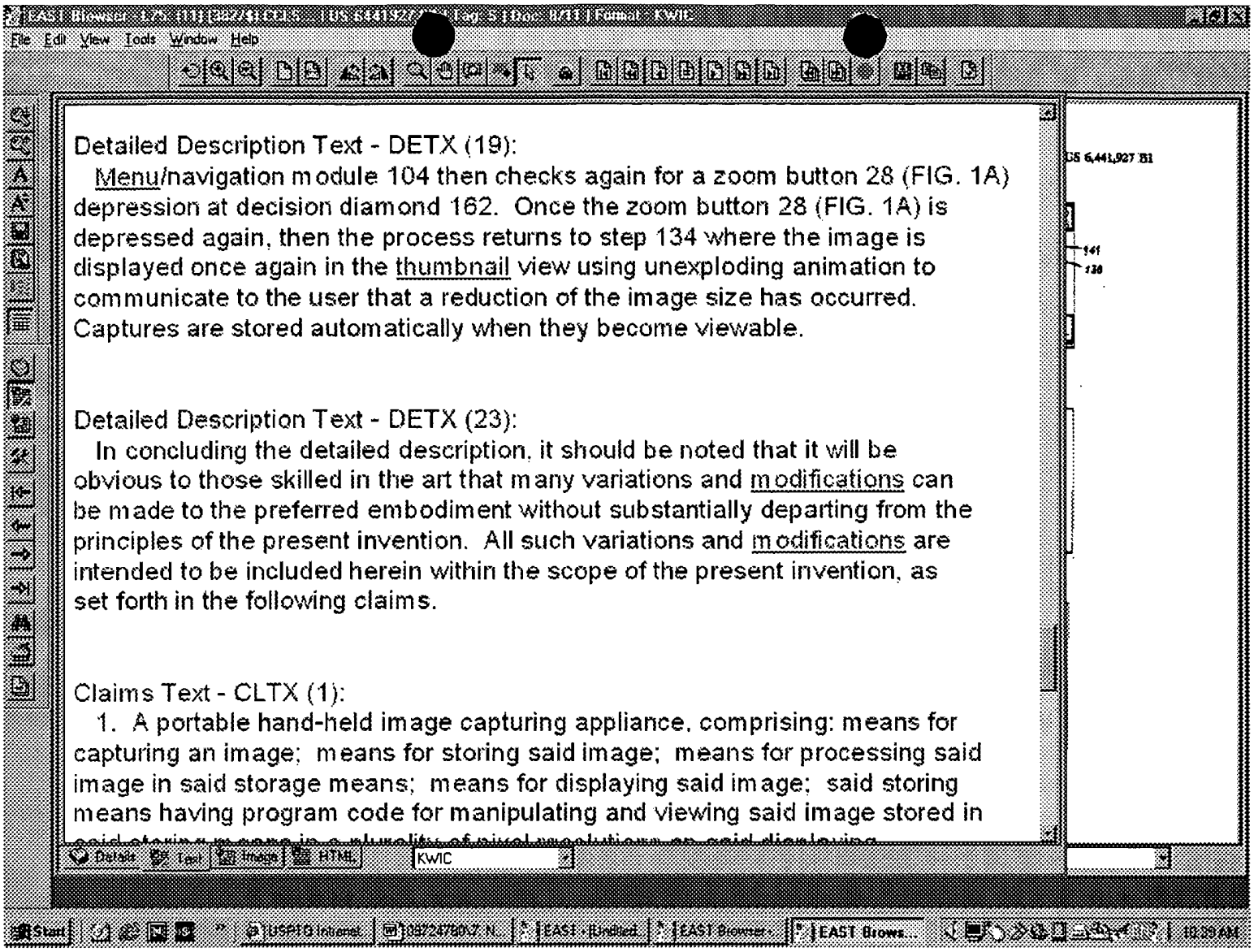
display 24 as illustrated in FIG. 8C. Zoom view module 84 allows the user to magnify a portion of a page as illustrated in FIG. 8D. The operation of the zoom view module 84 will be discussed in detail hereinafter. Page rotation module 86 allows the user to rotate a page either in thumbnail or zoom view in 90.degree. increments. Attach page module 88 allows the user to logically join pages together to form a group of pages that can be deleted, sent or viewed as an individual unit, but not rotated or zoomed. Rotation and zoom always apply only to the current page. Conversely, detach page module 92 allows the user to separate a page or pages from a previously formed group. Send page module 96 allows the user to transfer a page or group of pages to another appliance, device or system through the serial or IR communication ports of appliance 22. Error utility module 98 provides notification to the user when the user attempts an invalid operation. Help utility module 102 provides the user, in real time, with general instructions and animations on operating appliance 22 and context sensitive instructions for performing a specific operation. Lastly. menu/navigation interface module 104 provides the user with graphical menus for performing various operations and processes the user's response thereto. Moreover, menu/navigation interface module 104 responds to navigation buttons 42, 44, 46, and 48 that allow the user to steer a course through the graphical menus and view the stored pages.

Detailed Description Text - DETX (9):

From thumbnail view state 112, one of four menu states can be entered

Detailed Description Text - DETX (9):

From thumbnail view state 112, one of four menu states can be entered depending on the choice made by the user. First, activation of tools button 38 will transition the system into tools menu state 118 where a menu of possible page operations and/or features is exhibited on display 24 as illustrated in FIGS. 4A and 4B. Second, activation of send button 26 will transition the system into send menu state 122 where a menu of options for transferring a page or group of pages to another appliance, device or system is exhibited on display 24 as illustrated in FIG. 5. Third, activation of delete button 34 will transition the system into delete menu state 124 where a menu of options for deleting a page or group of pages from memory 64 is exhibited on display 24 as illustrated in FIG. 6. Lastly, activation of help button 36 will transition the system into help menu state 126 where a menu of help topics is exhibited on display 24 as illustrated in FIG. 7. Once any of the aforementioned menu states is reached, the user can choose a desired menu option by using navigation buttons 42 and 44 and then validating the choice by pressing a confirmation button. In the preferred embodiment of the present invention, the confirmation button is simply the button by which the present menu on display is accessed. An icon indicating the appropriate confirmation button is displayed in the lower left hand side of the menus as illustrated in FIGS. 4 through 7. Menu states may be exited by simply invoking navigation button 46 to transition to a previous state.



Detailed Description Text - DETX (19):

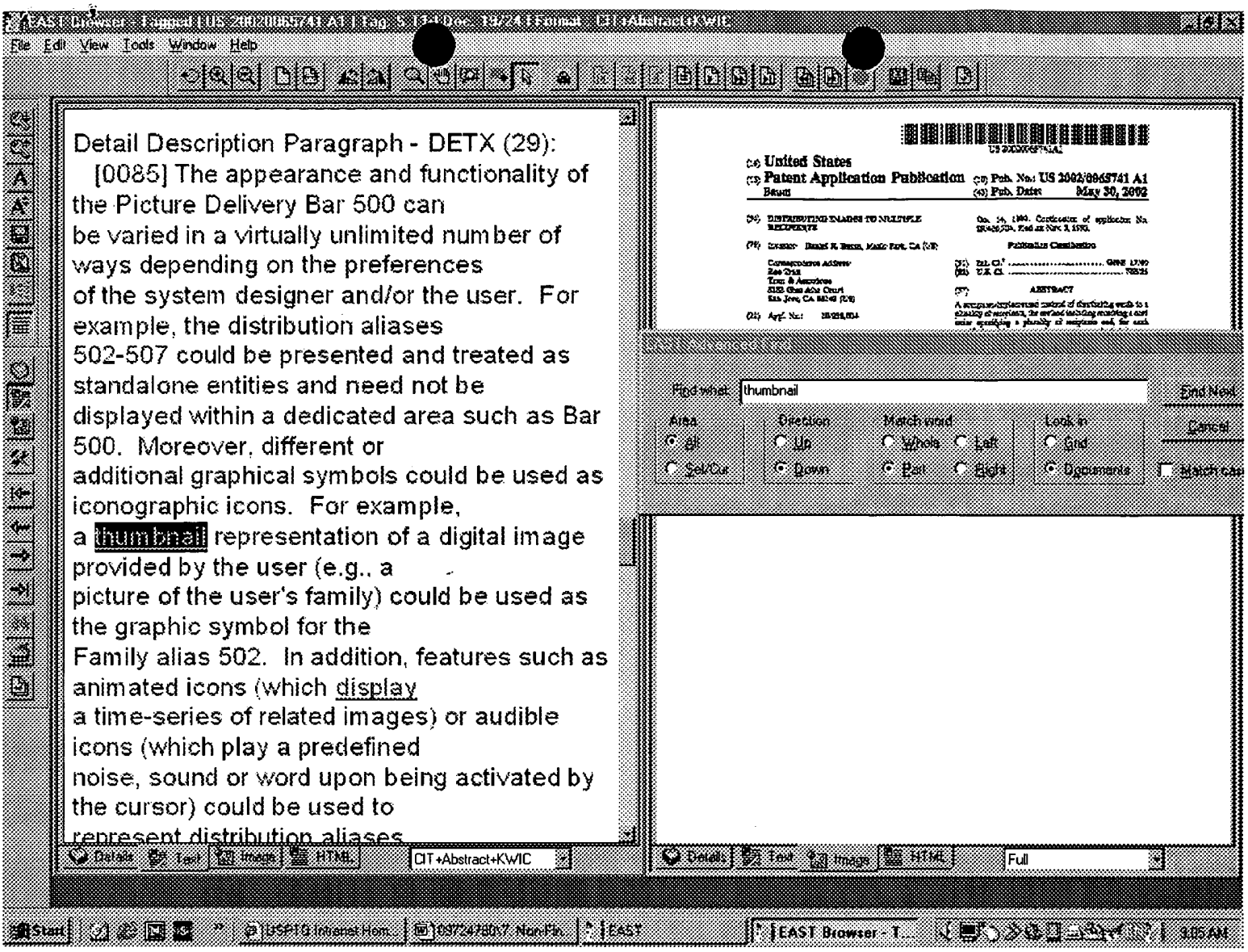
Menu/navigation module 104 then checks again for a zoom button 28 (FIG. 1A) depression at decision diamond 162. Once the zoom button 28 (FIG. 1A) is depressed again, then the process returns to step 134 where the image is displayed once again in the thumbnail view using unexploding animation to communicate to the user that a reduction of the image size has occurred. Captures are stored automatically when they become viewable.

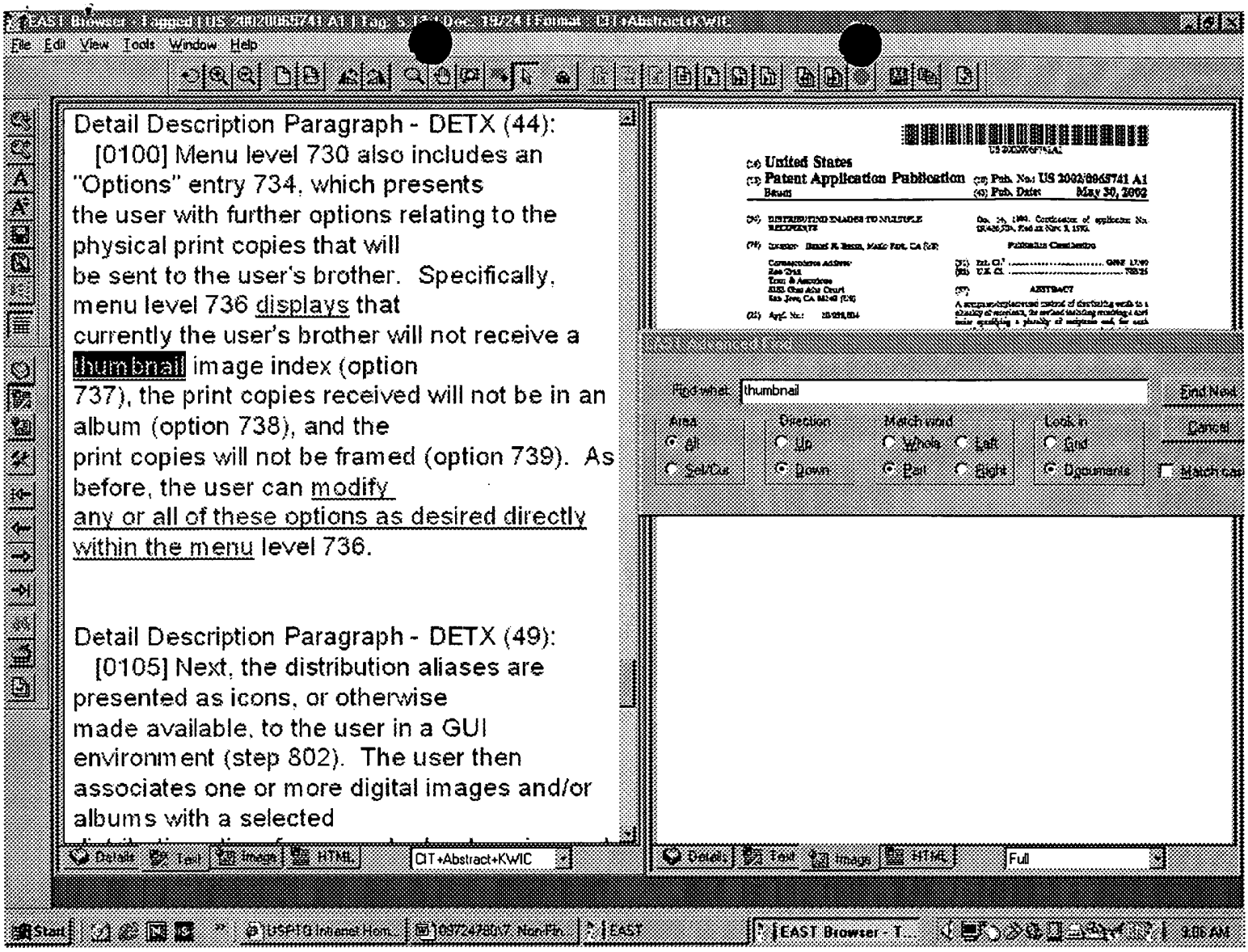
Detailed Description Text - DETX (23):

In concluding the detailed description, it should be noted that it will be obvious to those skilled in the art that many variations and modifications can be made to the preferred embodiment without substantially departing from the principles of the present invention. All such variations and modifications are intended to be included herein within the scope of the present invention, as set forth in the following claims.

Claims Text - CLTX (1):

1. A portable hand-held image capturing appliance, comprising: means for capturing an image; means for storing said image; means for processing said image in said storage means; means for displaying said image; said storing means having program code for manipulating and viewing said image stored in


EAST Browser - Tagged [US-20020065741-A1] Tag: 5 [1 Doc: 19/24] Format: CIT+Abstract+KWIC
File Edit View Tools Window Help
Detail Description Paragraph - DETX (29):
[0085] The appearance and functionality of the Picture Delivery Bar 500 can be varied in a virtually unlimited number of ways depending on the preferences of the system designer and/or the user. For example, the distribution aliases 502-507 could be presented and treated as standalone entities and need not be displayed within a dedicated area such as Bar 500. Moreover, different or additional graphical symbols could be used as iconographic icons. For example, a thumbnail representation of a digital image provided by the user (e.g., a picture of the user's family) could be used as the graphic symbol for the Family alias 502. In addition, features such as animated icons (which display a time-series of related images) or audible icons (which play a predefined noise, sound or word upon being activated by the cursor) could be used to represent distribution aliases
Details Text Image HTML CIT+Abstract+KWIC
(12) United States
(19) Patent Application Publication
Braun
(10) Pub. No.: US 2002/0065741 A1
(43) Pub. Date: May 30, 2002
ABSTRACT
Find what: thumbnail
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Cancel
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Direction Up Down
Match word Whole Left Part Right
Look in Grid Documents
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Details Text Image HTML Full
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09724780\7 Non-Fin...
EAST
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3:05 AM


File Edit View Tools Window Help
Detail Description Paragraph - DETX (44):
[0100] Menu level 730 also includes an "Options" entry 734, which presents the user with further options relating to the physical print copies that will be sent to the user's brother. Specifically, menu level 736 displays that currently the user's brother will not receive a thumbnail image index (option 737), the print copies received will not be in an album (option 738), and the print copies will not be framed (option 739). As before, the user can modify any or all of these options as desired directly within the menu level 736.
Detail Description Paragraph - DETX (49):
[0105] Next, the distribution aliases are presented as icons, or otherwise made available, to the user in a GUI environment (step 802). The user then associates one or more digital images and/or albums with a selected
(54) United States
(12) Patent Application Publication
(10) Pub. No.: US 2002/0065741 A1
(43) Pub. Date: May 30, 2002
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Find Next
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Text
Image
HTML
DT+Abstract+KWIC
Full
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EAST Browser - T...
9:06 AM

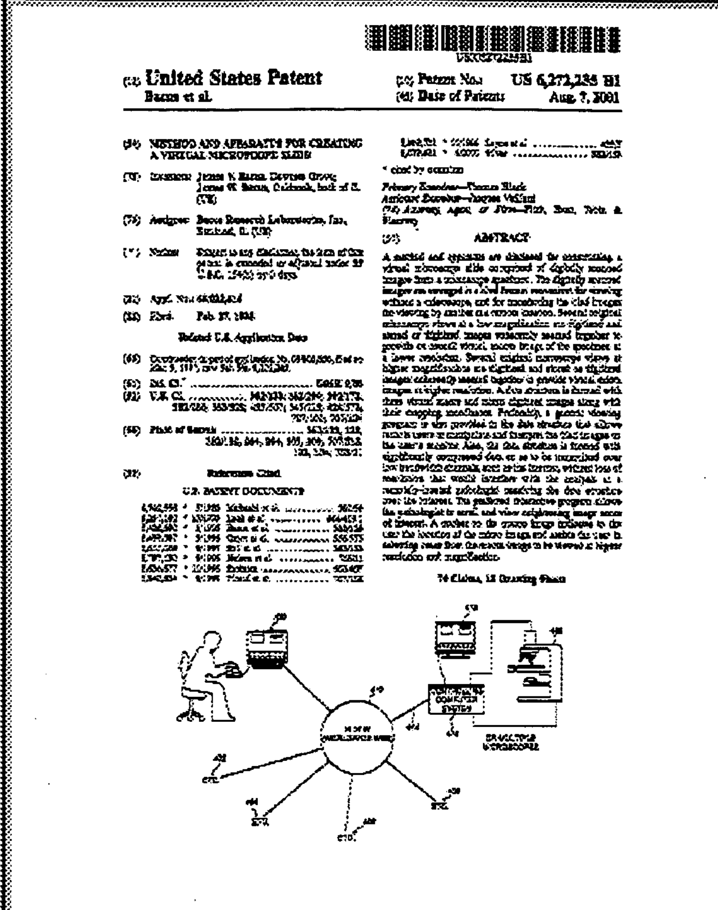
File Edit View Tools Window Help

case visually the view is of a virtual microscope slide at multiple
resolutions.

Brief Summary Text - BSTX (30):
The control program, which in the preferred embodiment of the invention is a
dynamic self-executing program such as a JAVA applet. allows the user to
manipulate and interpret the images while on a browser. The dynamic,
self-executing program is completely self-contained with its own display and interpretative program for operation by the user of the browser.

Brief Summary Text - BSTX (33):
In accordance with another important aspect of the invention, there is
provided with the self-executing data structure (the stored macro images, micro
images and dynamic, self-executing program

Details Text Image HTML KWIC

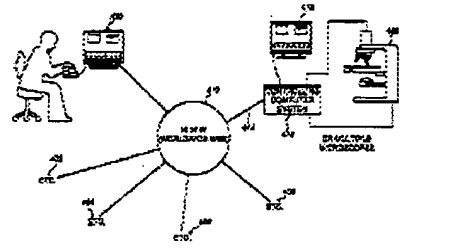


Details Text Image HTML Full

Start USPTO Info 09724780 EAST - [Unt... EAST Brow... EAST Brow... EAST Br... 11:35 AM

Brief Summary Text - BSTX (33):

In accordance with another important aspect of the invention, there is provided with the self-executing data structure (the stored macro images, micro images and dynamic, self-executing program for viewing, reconstructing and manipulating the stored images) the ability to scroll through the displayed images. This allows the user not only to see one image tile at a particular magnification, but also to use a pointer or to otherwise move a point to cause displayed images from adjacent neighboring image tiles which were not previously viewable to be included in the field being viewed by the user. That is, the user may shift the viewing location across tile boundaries from one tile to another, and up or down, or right or left or to other points of interest in a normal two-dimensional scrolling manner. Thus, the user is provided with an archived stored slide at

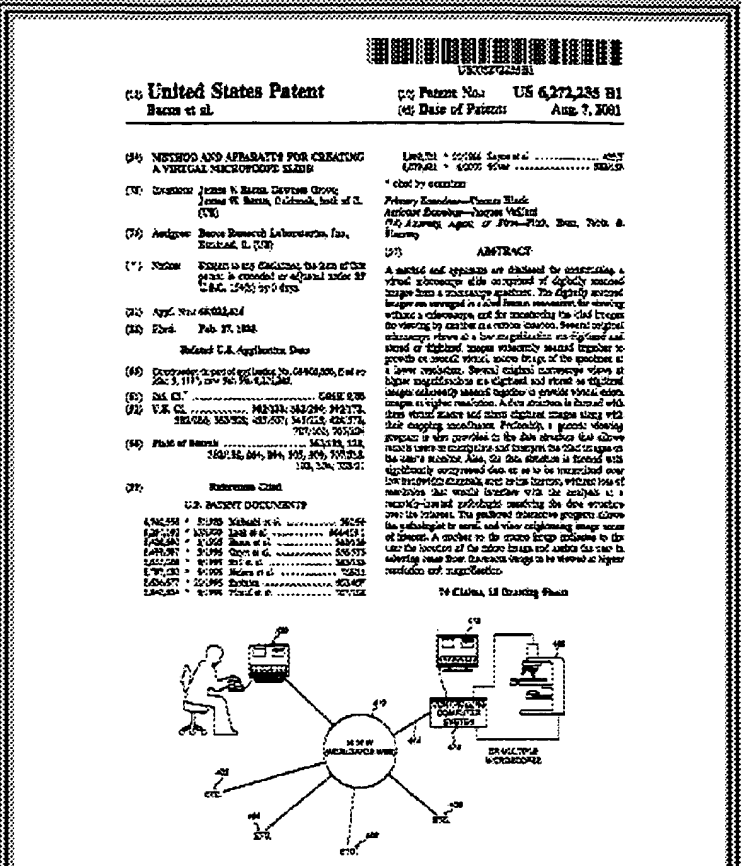


EAST Browser: Edit [2] - [272238.pn. US 6272238 B1.pn.] Top: 1 Doc: 2/2 Format: KWIC
File Edit View Tools Window Help

Brief Summary Text - BSTX (34):

In addition to the Internet browser, the data images can be viewed, reconstructed and manipulated using a dynamic, self-executing program such as, for example, a JAVA applet or an ACTIVE-X applet. An advantage of using a dynamic, self-executing program which is linked with the data images on a data structure is that the data images can be viewed, reconstructed and manipulated independent of the operating system of the users computer. Additionally, the user does not have to acquire the latest version of the dynamic, self-executing program since it is already linked with and provided with the data images on the data structure or on the storage medium. Thus, the user can always view the data images, regardless of different program versions.

Brief Summary Text - BSTX (39):



(12) **United States Patent**
Bacus et al.

(10) Patent No.: US 6,272,235 B1
(45) Date of Patent: Aug. 7, 2001

(54) METHOD AND APPARATUS FOR CREATING A VIRTUAL MICROSCOPE SLIDE

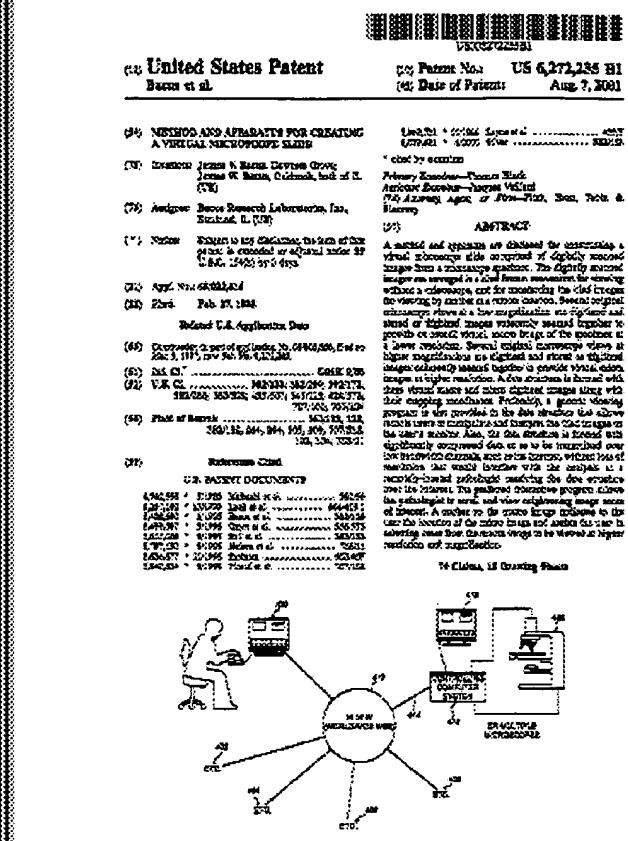
ABSTRACT

A method and apparatus are disclosed for constructing a virtual microscope slide comprised of digitally stored images from a microscope specimen. The digitally stored images are arranged in a tiled format, for viewing without a microscope, and for manipulating the tiled images for viewing by another at a remote location. Several original microscopic views at a low magnification are digitized and stored as tiled images wherein adjacent images overlap to provide virtual, seamless images at higher resolution. A data structure is formed which stores virtual frames and stores digitized images along with their mapping coordinates. Preferably, a generic viewing program is also provided in the data structure that allows remote users to manipulate and interpret the tiled images on the user's monitor. Also, the data structure is formed with significantly compressed data so as to be transmitted over low bandwidth channels over the Internet, without loss of resolution that would interfere with the analysis of a remotely-located pathologist resulting the data structure over the Internet. The preferred interactive program allows the pathologist to scroll and view neighboring image areas of interest. A cursor on the remote image indicates to the user the location of the entire image and assists the user in selecting areas that can be viewed at higher resolution and magnification.

Details Text Image HTML KWIC
Details Text Image HTML Full
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Brief Summary Text - BSTX (39):

After downloading or installation of a data structure on a storage medium, when the user desires to view the data images, he uses a mouse and "clicks" on the icon for the self-executing data structure. The dynamic, self-executing program displays the image in a window. Typically, the program will display a macro or thumbnail view of the entire specimen image at a lower magnification and a smaller window containing a particular image tile or groups of tiles at a higher magnification. The program enables the user to use the mouse or other pointing device to select a point or outline a region on the thumbnail view. The selected view will then be displayed in the smaller window at the second magnification. The user can move the mouse or pointing device and the image in the smaller window will scroll with the selection on the thumbnail view. In this way, the program simulates movement of a



(12) **United States Patent**
Bacus et al.

(10) Patent No.: US 6,272,235 B1
(45) Date of Patent: Aug. 7, 2001

(54) METHOD AND APPARATUS FOR CREATING A VIRTUAL MICROSCOPE SLIDE

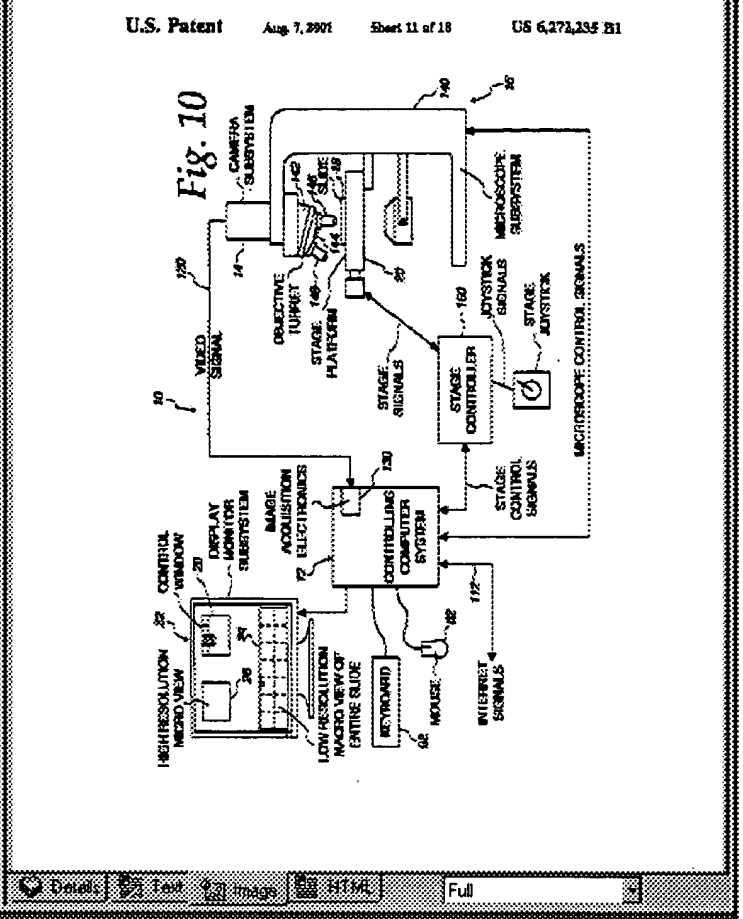
ABSTRACT

A method and apparatus are disclosed for constructing a virtual microscope slide comprised of digitally scanned images from a microscope specimen. The digitally scanned images are arranged in a tiled format, permitting the viewing without a microscope, and for transferring the tiled images for viewing by another computer system. Several original microscope views at a low magnification are digitized and stored or digitized images subsequently scanned together to provide a lower resolution. Several original microscope views at higher magnifications are digitized and stored as tiled images subsequently scanned together to provide virtual, zoom, images at higher resolution. A data structure is formed with these virtual views and tiled digitized images along with their mapping coordinates. Preferably, a generic viewing program is also provided in the data structure that allows users to manipulate and interpret the digitized images on the user's monitor. Also, the data structure is formed with significantly compressed data so as to be transmitted over low bandwidth channels, such as the Internet, without loss of resolution, that would interfere with the analysis of a remotely-located pathologist receiving the data structure over the Internet. The preferred interactive program allows the pathologist to scroll and view neighboring image areas of interest. A cache in the system keeps subsets of the data structure in memory to allow the location of the entire image not within the current viewing zone from the remote image to be viewed at higher resolution and magnification.

76 Claims, 18 Drawing Sheets

region on the thumbnail view.
The selected view will then be displayed in the smaller window at the second magnification. The user can move the mouse or pointing device and the image in the smaller window will scroll with the selection on the thumbnail view. In this way, the program simulates movement of a microscope slide under the field of view of the mechanical microscope. However, it should be noted that because of the one-to-one correspondence between the CCD pixels and the screen pixels, not all macro images may be able to be displayed on the monitor. The user may scroll through the macro image or select a compression feature to display the entire macro image in the window.

Drawing Description Text - DRTX (17):
FIG. 13 is a display screen showing control parameters to be manipulated thereon:



region on the thumbnail view.
The selected view will then be displayed in the smaller window at the second magnification. The user can move the mouse or pointing device and the image in the smaller window will scroll with the selection on the thumbnail view. In this way, the program simulates movement of a microscope slide under the field of view of the mechanical microscope. However, it should be noted that because of the one-to-one correspondence between the CCD pixels and the screen pixels, not all macro images may be able to be displayed on the monitor. The user may scroll through the macro image or select a compression feature to display the entire macro image in the window.

Drawing Description Text - DRTX (17):
FIG. 13 is a display screen showing control parameters to be manipulated thereon:

Fig. 17

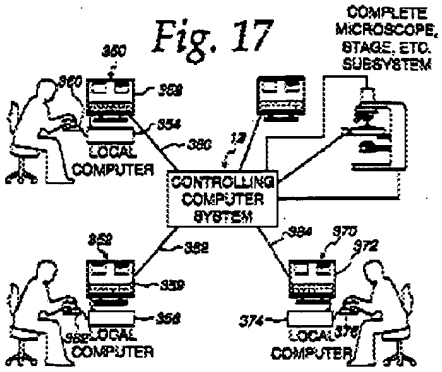
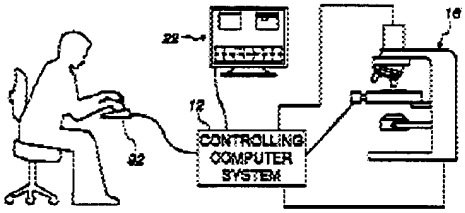


Fig. 17A



region on the thumbnail view.
The selected view will then be displayed in the smaller window at the second magnification. The user can move the mouse or pointing device and the image in the smaller window will scroll with the selection on the thumbnail view. In this way, the program simulates movement of a microscope slide under the field of view of the mechanical microscope. However, it should be noted that because of the one-to-one correspondence between the CCD pixels and the screen pixels, not all macro images may be able to be displayed on the monitor. The user may scroll through the macro image or select a compression feature to display the entire macro image in the window.

Drawing Description Text - DRTX (17):
FIG. 13 is a display screen showing control parameters to be manipulated thereon:

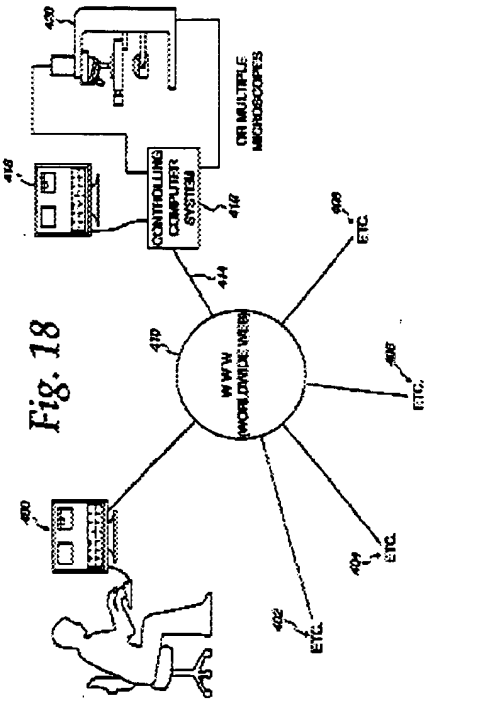


Fig. 18

Drawing Description Text - DRTX (22):
FIG. 17 is a block diagram of a networked system allowing multiple workstations to obtain access to the microscope and to manipulate the microscope locally at each workstation;

Detailed Description Text - DETX (2):
FIG. 1 is a block diagram of a system according to the invention for creating, and transmitting over an intranet or via the Internet a virtual microscope slide, i.e. interrelated data structures and display procedures depicting at multiple resolutions, images of a specimen on a microscope slide. The system includes a microscope with a digital platform for supporting the microscope slide. Digital platform or stage 11 has been specially calibrated to include a large number of increments for

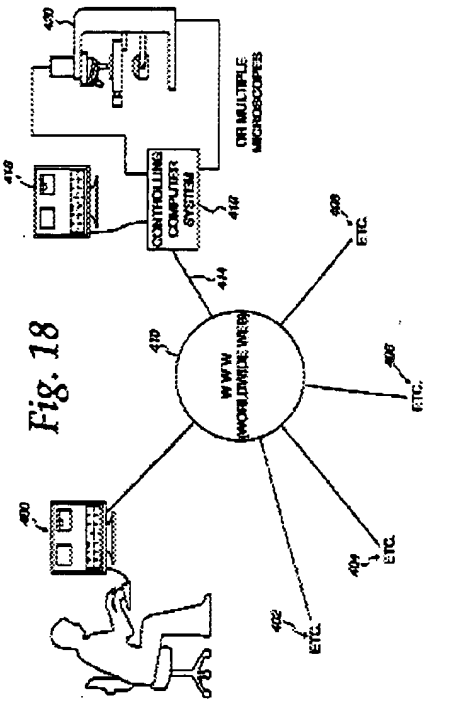


Fig. 18

Detailed Description Text - DETX (3):

For exemplary purposes, the creation of virtual microscope slide specimen according to the invention will be described with respect to a breast cancer specimen. The first step in creating a data structure according to the invention is to establish a macro image of the entire specimen (or that portion of the specimen desired to be stored as the macro image). The purpose for creating the macro or large area thumbnail image is to enable the viewer to see the entire specimen at once and to use the entire image to choose those significant portions thereon for viewing at greater magnification. In this example, the user has selected 1.25.times. as the magnification to display the entire breast cancer slide. Once specimen 13a has been placed on stage 11, rotating optical assembly 15 are rotated to select lens 17 which corresponds to the 1.25.times. magnification.

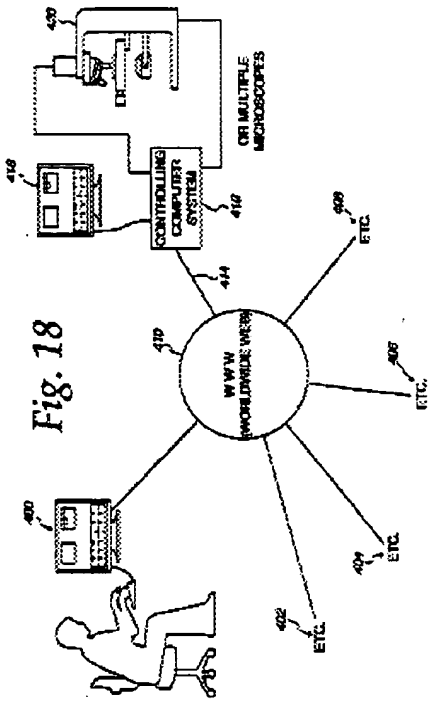


Fig. 18

Detailed Description Text - DETX (9):

To display the resulting image, computer 32 calculates the appropriate portion to be displayed from each image tile depending upon the relative size of the display screen. Since the stored image data is usually greater than the size of the typical monitor, the viewer must scroll through the image on the window to view it entirely. However, an optional compression algorithm can be used to compress the entire image into the viewing window. The X-Y coordinate information is used by the viewing and manipulation program to reconstruct the image tiles into a complete image of the specimen. The resulting image is larger, and with better resolution than would be achieved if optics technology were able to construct a single lens capable of viewing the entire specimen in one field of view. In this example, each of the 80 image tiles has digital resolution of 752 times 480 pixels, with

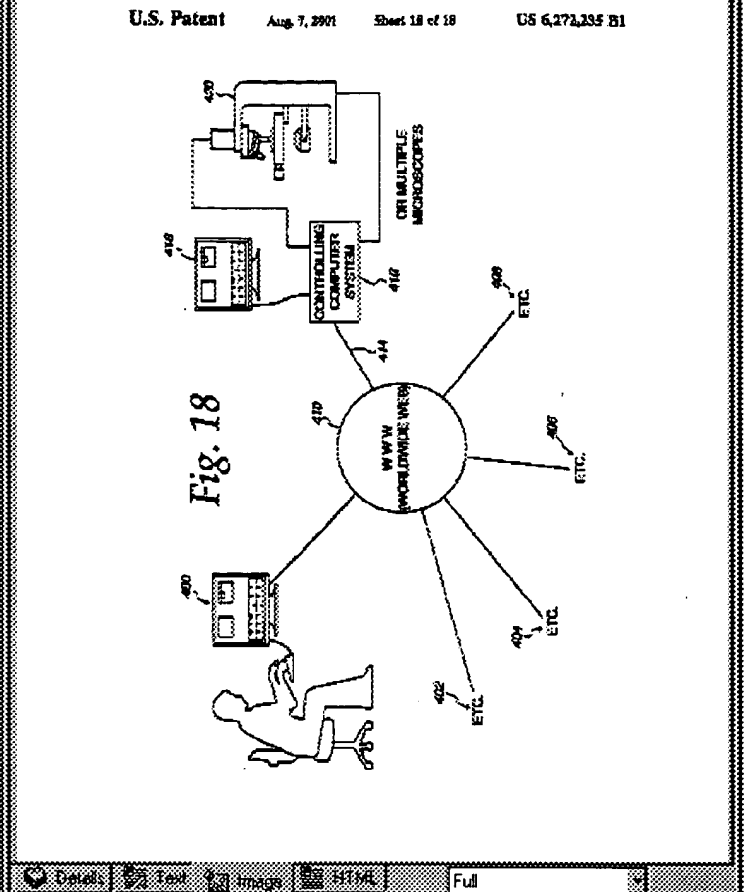


Fig. 18

depending upon the relative size of the display screen. Since the stored image data is usually greater than the size of the typical monitor, the viewer must scroll through the image on the window to view it entirely. However, an optional compression algorithm can be used to compress the entire image into the viewing window. The X-Y coordinate information is used by the viewing and manipulation program to reconstruct the image tiles into a complete image of the specimen. The resulting image is larger, and with better resolution than would be achieved if optics technology were able to construct a single lens capable of viewing the entire specimen in one field of view. In this example, each of the 80 image tiles has digital resolution of 752.times.480 pixels, with corresponding optical resolution of approximate 0.2 microns at 40.times. to approximately 6.4 microns at 1.25.times..

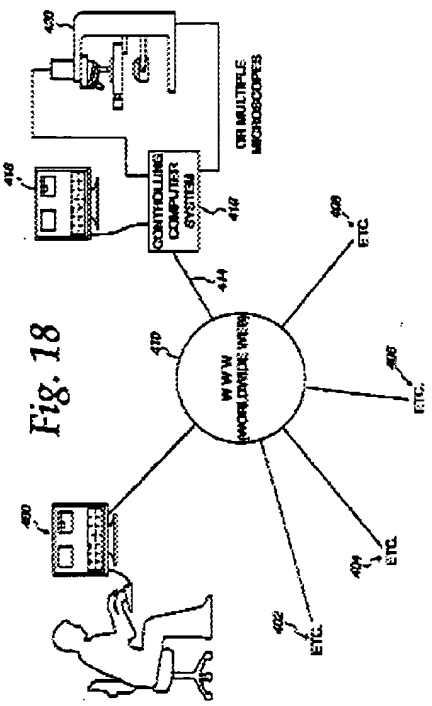


Fig. 18

seen under Windows 95 file manager showing the data files included in an alternate data structure, one in which the data files have been compressed or converted to JPEG (.jpg) format for a breast cancer specimen. The file index.html (shown in Table 3) is the listing which contains the X-Y coordinate information for these data files. This is the information that is read by the dynamic, self-executing program for viewing, reconstructing and manipulating the image tiles into the macro and micro views.

Detailed Description Text - DETX (26):

Referring now to the drawings, and especially to FIGS. 9A, 9B and 10, apparatus for synthesizing low magnification and high magnification microscopic images is shown therein and generally identified by reference numeral 10. The system includes a computer 12 which is a dual

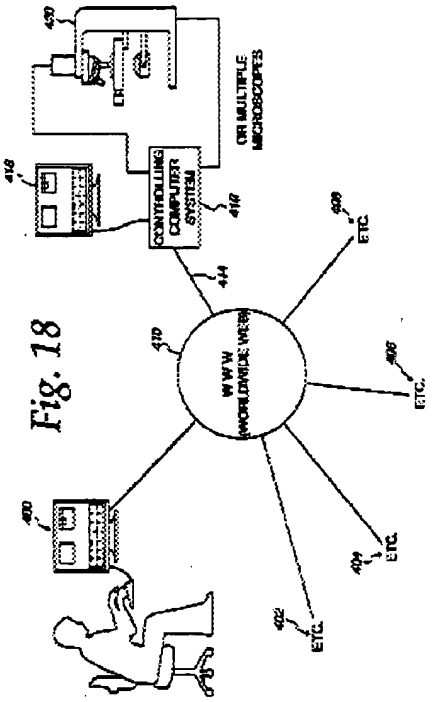
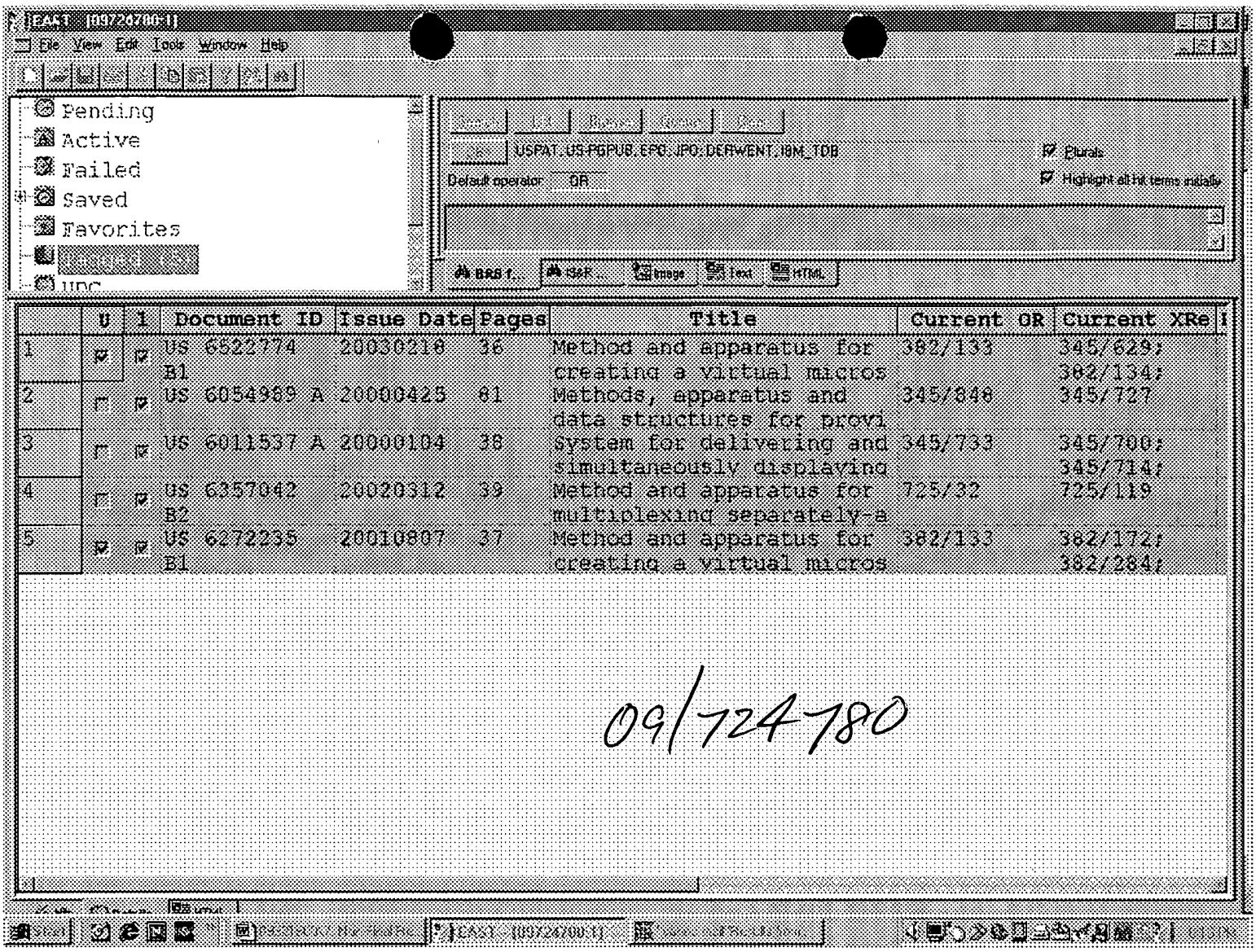


Fig. 18


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USPAT,US-PGPUB,EPO,JPO,DERWENT,IBM_TDB
Default operator: OR
Plurals
Highlight all hit terms initially
Basic
ISR
Image
Text
HTML
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1
Document ID
Issue Date
Pages
Title
Current OR
Current XRe
1 US 6522774 B1 20030218 36 Method and apparatus for creating a virtual micros 382/133 345/629; 382/134;
2 US 6054989 A 20000425 81 Methods, apparatus and data structures for provi 345/848 345/727
3 US 6011537 A 20000104 38 System for delivering and simultaneously displaying 345/733 345/700; 345/714;
4 US 6357042 B2 20020312 39 Method and apparatus for multiplexing separately-a 725/32 725/119
5 US 6272235 B1 20010807 37 Method and apparatus for creating a virtual micros 382/133 382/172; 382/284;
09/724780

DERWENT-ACC-NO: 1988-093461

DERWENT-WEEK: 200261

COPYRIGHT 1999 DERWENT INFORMATION LTD

TITLE: Video image processing appts. with multiple displays - has transparent energised conductive surface which acts as input, integrated communication link, and performs hierarchical filing

INVENTOR: DUNK, M F; JAKOBS, T ; JUNG, D W ; KARLIN, R A ; REIFFEL, L ; TAM, R K ; TUTTT, T T ; JUNG, W D ; TUTT, T T

PATENT-ASSIGNEE: INTERAND CORP[INTEN] , GOLDSTAR ELECTRON CO LTD[GLDS], LG SEMICON CO LTD[GLDS]

PRIORITY-DATA: 1986US-0914924 (October 3, 1986) , 1989US-0395160 (June 17, 1989) , 1991US-0751605 (August 21, 1991) , 1994US-0222155 (April 4, 1994)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC	
JP 2002196849 A	July 12, 2002		013	G06F 003/00	N/A
EP 262991 A	April 6, 1988		003	N/A	E
US 5300943 A	April 5, 1994		000	G09G 005/00	N/A
JP 10105366 A	April 24, 1998		017	G06F 003/153	N/A
US 5892509 A	April 6, 1999		000	G06F 013/00	N/A
JP 2000105742 A	April 11, 2000		014	G06F 015/00	N/A
JP 2000105837 A	April 11, 2000		014	G06T 011/80	N/A

DESIGNATED-STATES: DE FR GB

CITED-DOCUMENTS: 1.Jnl.Ref; A3...198944 ; DE 2613906 ; No-SR.Pub ; US 4001807

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
JP2002196849A	Div ex		
1999JP-0204569			October 3, 1987
JP2002196849A	N/A		
2001JP-0317249			October 3, 1987
EP 262991A	N/A		
1987EP-0308804			October 5, 1987
US 5300943A	Cont of		
1986US-0914924			October 3, 1986
US 5300943A	Cont of		
1989US-0395160			June 17, 1989
US 5300943A	N/A		
1991US-0751605			August 21, 1991
JP 10105366A	Div ex		
1987JP-0250562			October 3, 1987
JP 10105366A	N/A		
1997JP-0124320			October 3, 1987
US 5892509A	Cont of		
1986US-0914924			October 3, 1986
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US 5892509A	Cont of		
1991US-0751605			August 21, 1991
US 5892509A	N/A		
1994US-0222155			April 4, 1994
US 5892509A	Cont of	US 5300943	N/A
JP2000105742A	Div ex		
1999JP-0173202			October 3, 1987
JP2000105742A	N/A		
1999JP-0204569			October 3, 1987
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1987JP-0250562			October 3, 1987
JP2000105837A	N/A		
1999JP-0173202			October 3, 1987

INT-CL (IPC): G06F001/16, G06F001/32 , G06F003/00 , G06F003/02 , G06F003/033 , G06F003/153 , G06F013/00 , G06F015/00 , G06T011/80 , G09F009/00 , G09G005/00

RELATED-ACC-NO: 1988-093459, 1989-326182 , 1991-065573

ABSTRACTED-PUB-NO: EP 262991A

BASIC-ABSTRACT:

The video image processing appts. has multiple display devices, and function symbols, where each symbol is associated with a partic. appts. function. A spatial coordinate sensor is positioned between the display device, function symbols, and appts. user. The appts. is responsive to the position of a stylus w.r.t. the sensor. A mechanical adjustment device alters the height and orientation of the appts.

The sensor has an energised conductive surface comprising a transparent material. It can be used as an overlay for e.g. video displays. With proper electronic control, the stylus can be used to interact with the image on the video display.

USE/ADVANTAGE - Personal business computer; word processing, graphics, accounting, CAD, etc. Maximises ability of user to create, capture, manipulate, annotate, reproduced, file, transmit and otherwise communicate electronic images, enables overlays of any combination of images, graphics, or text, paperless editing.

ABSTRACTED-PUB-NO: US 5300943A

EQUIVALENT-ABSTRACTS:

A work station has multiple, functionally related displays clustered under and controlled by a common transparent overlay control device. The position of a hand-held stylus sensed by the overlay control device is used as a system input

to control system operations, system communications and input, manipulation and editing of images displayed on the displays. Control of certain work station operations is achieved by directing the stylus towards function symbols which are fixed to the overlay surface.

Actuators or other adjustment mechanisms are provided for adjustment of the height and pitch of the work station for the comfort of the operator. The work station provides integrated data audio communication over ordinary narrow-band telephone lines or high speed data lines with other linked workstations.

(No

US 5892509A

The video image processing appts. has multiple display devices, and function symbols, where each symbol is associated with a partic. appts. function. A spatial coordinate sensor is positioned between the display device, function symbols, and appts. user. The appts. is responsive to the position of a stylus w.r.t. the sensor. A mechanical adjustment device alters the height and orientation of the appts.

The sensor has an energised conductive surface comprising a transparent material. It can be used as an overlay for e.g. video displays. With proper electronic control, the stylus can be used to interact with the image on the video display.

USE/ADVANTAGE - Personal business computer; word processing, graphics, accounting, CAD, etc. Maximises ability of user to create, capture, manipulate, annotate, reproduced, file, transmit and otherwise communicate electronic images, enables overlays of any combination of images,

graphics, or text,
paperless editing.

CHOSEN-DRAWING: Dwg.2/4

TITLE-TERMS: VIDEO IMAGE PROCESS APPARATUS MULTIPLE DISPLAY TRANSPARENT
ENERGISE CONDUCTING SURFACE ACT INPUT INTEGRATE COMMUNICATE LINK
PERFORMANCE HIERARCHY FILE

ADDL-INDEXING-TERMS:
MAGNETIC DISC CPU FACSIMILE

DERWENT-CLASS: P85 T01

EPI-CODES: T01-C02; T01-C02B1;

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N1988-070718

EAST Browser : L70: [2] digital an... | US 6396963 B2 | ... S | Doc: 2/2 | Format: KWIC
File Edit View Tools Window Help

the photocollage from the stored images by generating a plurality of pages of the stored images.

Drawing Description Text - DRTX (7):

FIG. 6 is a flow chart showing the steps performed by the present invention; towards preparation of a photocollage that is in a digital file format that can be sent across the internet;

Detailed Description Text - DETX (2):

An acceptable photo album or photocollage can be created automatically from customers' exposed film, negatives, or digital images.

Detailed Description Text - DETX (4):

As shown in FIG. 2, the collection step begins when a customer, having completed picture taking for one or more events delivers one or more exposed film strips or cartridges 10, digital still camera memory cards 12, photographic prints 6 or video camera media 8 to a processing facility 14. At the time that the customer delivers the exposed film cartridge(s) to the processing facility the customer's identity is recorded and associated with the suite of film cartridges and other image

NY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/222,393**

(22) Filed: **Dec. 29, 1998**

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TITLE: Order information recording system and photographic image processing method

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In a case in which simultaneous printing is to be carried out, thumbnail image data is recorded onto an IC chip which is provided at a cartridge loaded in a camera. A control section reads the thumbnail image data from the IC chip and outputs the data to a personal computer via an I/F section. A user designates order information for each frame image while viewing an order information setting screen of the personal computer. Designated order information is transmitted to the camera via a serial port of the personal computer. The control section records received order information onto the IC chip. In a case in which reprinting is to be carried out at a laboratory, a printing process is performed on the basis of the order information recorded on the IC chip. With this arrangement, a customer need not designate order information at a shop.

A conventional digital printing system is known in which a frame image recorded on a photographic film is read by a sensor such as a charge-coupled device (CCD) to obtain digital image data of the frame image, and then printing processing is conducted on the basis of the obtained digital image data.

Putting such a digital printing system to practical use provides additional

degrees of freedom in image processing, and enables various types of high quality printing by the designation of order information such as, for example, the number of prints, the aspect ratio, instructions for trimming, various kinds of finishing processing such as black-and-white finishing, sepia finishing, slender-look finishing or soft focus, instructions for template processing, and the addition of characters. Especially in reprinting, there is a strong demand for various types of high quality printing for each image frame.

A fifth aspect of the present invention is the order information recording system according to one of the second to the fourth aspects of the invention, wherein the recording means is included in a camera which records a photographed image on the photographic photosensitive material or in a scanner which reads a photographed image recorded on the photographic photosensitive material, and said recording means photoelectrically converts the photographed image so that the photographed image is recorded as electronic image data.

Image data can be obtained in a digital laboratory system in which, for example, an image recorded on a photographic photosensitive material is read digitally and a printing process is conducted for the image. The information required for designating order information is not limited to image data, and information such as the frame number or the like may alternatively be used. The frame number is recorded, for example, at the time of photographing with a camera.

The reading means and the order information recording means may be included in a camera which records images on a photographic

photosensitive material. In such a case, image data is obtained at a digital laboratory system, and is recorded onto a storage element provided at the cartridge, and the cartridge is then loaded into a camera. The camera is connected to a personal computer, and the image data recorded on the storage element is read and sent to the personal computer upon instruction from the personal computer. An image based on this image data is displayed on a screen of the personal computer, and the order information can be set. The set order information is then sent to the camera and is written in the storage element of the cartridge. The image frames which have order information set therefor are then subjected to image processing at, for example, a lab, on the basis of the order information recorded on the storage element, as in the sixth aspect of the invention. Next, printing processing is carried out onto, for example, photographic printing paper. With this arrangement, the customer need not designate the order information at the shop. The image-processed data may be recorded on a recording medium such as a CD-R, MO or the like, instead of being used for printing processing onto photographic printing paper.

All of these reading means, setting means and order information recording means may be provided at the camera.

Moreover, a recording means may be included in the camera or in a scanner for reading photographed images recorded on photographic photosensitive materials, as in the fifth aspect of the invention. The recording means in this case photoelectrically converts a photographed image, and records the data as electronic image data on a storage medium such as a memory card or a storage element such as an IC provided at the cartridge. With this

arrangement, image
data is produced simultaneously with photographing, and is recorded on a
storage element of the cartridge or a memory card. This allows designation of
order information before simultaneous printing. Thus, costs can be reduced by,
for example, designating the frames which need not be printed.

FIG. 3 is a plan view of a negative film (which is adapted to APS printing).

FIG. 5 is a schematic structural view of a camera and a personal computer
for designating order information relating to the first embodiment of the
invention.

FIG. 6 is a schematic structural view of a camera and a personal computer
for designating order information relating to a second embodiment of the
invention.

FIG. 7 is a schematic structural view of a camera and a personal computer
for designating order information relating to a third embodiment of the
invention.

Within a casing 124 of the cartridge 122, there is provided a spool 126
which takes up a negative film 110 (see FIG. 2) in a roll form so that the
negative film 110 is accommodated in the cartridge 122.

As illustrated in FIG. 3, a magnetic recording layer 116 is provided at the
negative film 110. Moreover, optical information (in the form of a bar code
112) is recorded on the negative film 110. The bar code 112 represents a
negative film ID (hereinafter referred to as "film ID").

As illustrated in FIG. 2, a slit-shaped through hole 128 is formed at the
spool 126 along the axial direction of the spool 126.

Projecting pawls 130 are formed at an inner peripheral surface of the through hole 128. Holes 120 (see FIG. 3) formed in the negative film 110 fit together with these projecting pawls 130. The trailing end portion of the negative film 110 is thereby connected to the spool 126, and the negative film 110 can be taken up in a roll form. A cartridge ID is recorded in advance on the outer peripheral surface of the cartridge 122 in the form of a bar code or letters (or numbers). This cartridge ID basically matches the film ID.

An axial end of the spool 126 is rotated to allow the negative film 110 to be taken in and out of the cartridge 122.

As shown in FIG. 1, an IC chip 100 serving as a storage medium is embedded in the cartridge 122 of the present first embodiment. A plurality of terminals 102 (six in the present embodiment) are provided on the IC chip 100. The body of the IC chip 100 is embedded while the terminals 102 are exposed through rectangular openings 104 which are provided in correspondence with the respective terminals 102 at one end surface of the cartridge 122.

Digital image data (hereinafter referred to as "thumbnail image data") of an image recorded on the negative film 110 accommodated within the cartridge 122 may be recorded on the IC chip 100. This thumbnail image data is data of an image which has been read at a relatively low resolution in a scanner section 210 (see FIG. 4) of a laboratory system which will be described later.

Along with the aforementioned thumbnail image data, order information may be recorded on the IC chip 100. Examples of order information include the print size, the aspect ratio, instructions for trimming,

finishing processings (for example, black-and-white finishing, sepia finishing, slender-look finishing, soft focus, high key (adding a white color component throughout the image to give the image a fairy-tale-like feel) or the like), template processing (adding of predetermined shapes or characters to a part of or the outer periphery of a photograph), the addition of characters (e.g., adding a message) and the like.

At the receiving and sorting section 200, cartridges 122 are sorted into two different types: those designated in the figures and hereinafter by reference numeral A (i.e., cartridge 122 accommodating negative films 110 which are to be subjected to reorder printing) and those designated by reference numeral B (i.e., cartridges 122 accommodating negative films 110 which are to be subjected to simultaneous printing). Then, the cartridge 122 is conveyed to the first process at a detaching and splicing section 202.

At the detaching and splicing section 202, the negative film 110 is withdrawn from the cartridge 122, and the trailing end portion of the negative film is detached from the spool 126. Then, a plurality of negative films 110 are spliced into an elongated form to form a roll film. Developed negative films 110 (for reorder printing) and undeveloped negative films 110 (for simultaneous printing) are spliced separately from each other, i.e., developed and undeveloped negative films 110 are not spliced together.

At the detaching and splicing section 202, the cartridge ID is read from the cartridge 122 from which the negative film 110 is removed. The cartridge ID is stored, as a part of a set together with the information which was read by the